

CLAIM AMENDMENTS

- 1.(currently amended) A thick, solid, transparent radiation sensitive device for monitoring radiation dose comprising at least one radiation sensitive material in a polymeric binder wherein said radiation sensitive material is capable of undergoing an observable change when contacted with radiation wherein said device has an aspect ratio of less than 20:1.
- 2.(original) The thick, solid, transparent radiation sensitive device of claim 1 wherein said device comprises a molded polymer or casted polymer.
- 3-4.(canceled)
- 5.(original) The thick, solid, transparent radiation sensitive device of claim 1, wherein said radiation sensitive material comprises at least one material selected from a diacetylene; a radiochromic dye; a pH sensitive dye; a leuco dye; a carbinol dye and a radiation sensitive complex.
- 6.(original) The thick, solid, transparent radiation sensitive device of claim 5 wherein said diacetylene comprises at least one compound selected from 2,4-hexadiyn-1,6-diol, 3,5-octadiyn-1,8-diol, 4,6-decadiyn-1,10-diol, 5,7-dodecadiyn-1,12-diol, tricos-10,12-diyne, pentacos-10,12-diyne, their derivatives, including 2,4-hexadiyn-1,6-bis (n-Hexylurethane); 2,4-hexadiyn-1,6-bis (n-pentylurethane); 2,4-hexadiyn-1-mono (n-pentyl-urethane)-6-mono (n-hexylurethane); 2,4-hexadiyn-1-mono (n-hexyl-urethane)-6-mono (phenyl acetate); 5,7-dodecadiyn-1,12-bis(n-butoxycarbonyl methylurethane) and co-crystallized mixtures thereof.
- 7.(original) The thick, solid, transparent radiation sensitive device of claim 5 wherein said radiochromic dye is selected from fuschin cyanide, hexahydroxy ethyl violet cyanide,

pararose aniline cyanide, a tetrazolium dye including blue tetrazolium, tetrazolium violet, triphenyl tetrazolium chloride or mixture thereof.

8.(original) The thick, solid, transparent radiation sensitive device of claim 5 wherein said leuco dye is selected from leuco crystal violet, leuco malachite green or mixture thereof.

9.(original) The thick, solid, transparent radiation sensitive device of claim 5 wherein said carbinol dye is selected from malachite green carbinol base and p-roseaniline base.

10.(original) The thick, solid, transparent radiation sensitive device of claim 5 wherein said pH sensitive dye is selected from pentamethoxytriphenylmethanol, bromocresol purple, bromophenol blue or mixture thereof.

11.(original) The thick, solid, transparent radiation sensitive device of claim 1 wherein said radiation sensitive material is a complex of ammonium iron citrate.

12.(original) The thick, solid, transparent radiation sensitive device of claim 1 further comprising an activator.

13.(currently amended) The thick, solid, transparent radiation sensitive device of claim 12 wherein said activator is selected from a halocarbon, a halonium, a sulfonium, ethyl trichloroacetate, heptachloropropane, ethyltrichloroacetate, chloroacetic acid, chloropropionic acid, hexachlorocyclohexane, methyltrichloroacetimidate, trichloroacetic acid, trichloroacetamide, trichloro ethanol, trichloro methyl benzyl acetate, trichloro methyl propanol hydrate, trichloro propane, chlorinated polymers, diphenyliodonium iodide, diphenyliodonium hexafluoroarsenate, diphenyliodonium chloride, trimethylsulfonium iodide, triphenylsulfonium hexafluoroantimonate.

14-16.(canceled)

17.(original) The thick, solid, transparent radiation sensitive device of claim 1 wherein said binder is a polymerized monomer or oligomer.

18.(original) The thick, solid, transparent radiation sensitive device of claim 1 wherein said binder is a polymerized di or polyfunctional monomer or oligomer.

19.(canceled)

20.(currently amended) The thick, solid, transparent radiation sensitive device of ~~claim 17~~ claim 1 wherein said binder is a polymer prepared by polymerization of a monomer or oligomer by radical or cationic polymerization process using initiator, said monomer and oligomers is selected from olefins, vinyls, acrylates, methylmethacrylate, styrene and acrylic acid, or oligomeric methylmethacrylate, methylacrylate ~~or~~ polypropylenedimethacrylate hexamethylene diisocyanate, polyethylene glycol, polypropylene glycol or a reaction product of one of diol with diisocyanate, diepoxide with primary amine, primary diamine or secondary diamine, or a diamine with a diisocyanate.

21.(original) The thick, solid, transparent radiation sensitive device of claim 1 wherein said binder is a polymer prepared by initiating polymerization with UV and visible light.

22-26.(canceled)

27.(original) The thick, solid, transparent radiation sensitive device of claim 1 further comprising a solvent.

28-29.(canceled)

30.(currently amended) The thick, solid, transparent radiation sensitive device of ~~claim 28~~ claim 27 wherein said solvent is chosen from butoxy-2-ethylstearate, butyrolactone,

diethyl fumarate, dimethyl maleate, dimethylcarbonate, dioctyl phthalate, ethylene glycol dimethyl ether, ethyl salicylate, polyethylene glycol dimethylether, propylene carbonate, triacetin, benzyl ether, dodecyl-1,2-methyl pyrrolidone, ethoxyethylacetate, ethylene glycol diacetate, ethyltrichloroacetate, methylpyrrolidone, methyl sulfoxide, polyethylene glycols of different molecular weight, dimethylformamide, cyclohexane, p-dioxane, tetrahydrofuran, p-xylene and dioctylphthalate or dibutylphthalate.

31.(original) The thick, solid, transparent radiation sensitive device of claim 1 further comprising a converter.

32.(original) The thick, solid, transparent radiation sensitive device of claim 31 a wherein said converter is a radio/electron luminescence or fluorescence phosphor which emits UV light, or lower energy X-ray or electrons when contacted with high energy X-rays, gamma rays, or electrons.

33.(original) The thick, solid, transparent radiation sensitive device of claim 1 wherein said device is self-supporting.

34.(canceled)

35.(original) The thick, solid, transparent radiation sensitive device of claim 1 wherein said device has a thickness larger than 0.1 millimeter.

36-37.(canceled)

38.(original) The thick, solid, transparent radiation sensitive device of claim 1 wherein said observable change is selected from color change, change in fluorescence, phosphorescence, change in paramagnetic or NMR relaxation rate, when exposed to said radiation, liquid to solid, solid to liquid, or change in transparency.

39.(currently amended) The thick, solid, transparent radiation sensitive device of claim 1 further comprising at least one of a UV absorber and surfactant.

40.(canceled)

41.(currently amended) A process of making a thick, solid, transparent radiation sensitive molded or casted shaped polymeric device for monitoring radiation dose prepared by polymerization of at least one monomer or oligomer containing at least one radiation sensitive material capable of developing or undergoing a color, fluorescence, or opacity change when exposed to UV, X-ray, gamma ray, electron, protons, alpha particles or neutron radiation activator wherein said device has an aspect ratio of less than 20:1.

42.(canceled)

43.(currently amended) A process of making a thick, solid, transparent radiation sensitive molded or casted shaped polymeric device for monitoring radiation dose prepared by solidification of molten polymer containing at least one radiation sensitive material capable of developing or undergoing a color, fluorescence, or opacity change when exposed to radiation wherein said device has an aspect ratio of less than 20:1.

44-49.(canceled)

50.(original) A method of imaging and measuring a three-dimensional dose distribution of a radiation source in the device of claim 1 comprising the steps of irradiating said device such that the optical properties are changed upon irradiation, optically scanning the object at various angles, detecting and measuring light projection data indicative of optical changes in the device, calibrating the optical change in the device to the dose of the energy; and mapping the dose of the energy in the object.

51.(original) An optical tomographic scanner for imaging optical properties of device of claim 1 comprising at least one light source for illuminating the device, at least one light detector for measuring light that has interacted with the object, a mechanism that controls the relative motion of the object, the light source or sources, and the light detector or detectors, a tank filled with a liquid in which the object is immersed for refractive index matching, so that the light rays passing through the device are propagated in straight lines; and a computer for controlling the scanner mechanism and for calculating the three dimensional distribution of optical properties inside the object.

52.(original) A method of detecting, measuring and displaying a non-uniform dose of radiation or by forming a visible permanent three dimensional image in said device of claim 1 wherein said three dimensional image is representative of the three dimensional distribution of dose of said radiation to which said device is exposed.

53-66.(canceled)